

CLAIMS

What is claimed is:

1. A hollow composite article, comprising:
a multiple of braided bias angled fibers, said braided bias angled fibers oriented non-parallel to a longitudinal axis; and
a multiple of zero degree fibers interwoven with said multiple of braided bias angled fibers, said zero degree fibers substantially parallel to said longitudinal axis.
2. The hollow composite article as recited in claim 1, wherein said braided bias angled fibers are offset approximately 40 degrees relative said longitudinal axis.
3. The hollow composite article as recited in claim 1, wherein said braided bias angled fibers are offset approximately 45 degrees relative said longitudinal axis.
4. The hollow composite article as recited in claim 1, wherein said braided bias angled fibers follow a spiral path around said longitudinal axis.
5. The hollow composite article as recited in claim 1, wherein a leading edge and a trailing edge conic of said hollow composite article comprise said braided bias angle fibers.
6. The hollow composite article as recited in claim 1, wherein said braided bias angled fibers are oriented to accommodate a twist along said longitudinal axis.
7. The hollow composite article as recited in claim 1, wherein said zero degree fibers are positioned upon an upper and lower surface of said hollow composite article.

8. The hollow composite article as recited in claim 1, further comprising a separate composite sheet interwoven with said multiple of braided bias angled fibers and said multiple of zero degree fibers.

9. A composite rotor blade spar, comprising:
a multiple of braided bias angled fibers, said braided bias angled fibers oriented non-parallel to a longitudinal axis; and
a multiple of zero degree fibers interwoven with said multiple of braided bias angled fibers, said zero degree fibers substantially parallel to said longitudinal axis.
10. The composite rotor blade spar as recited in claim 9, wherein said longitudinal axis is a faying axis.
11. The composite rotor blade spar as recited in claim 9, wherein said braided bias angled fibers follow a spiral path around said longitudinal axis.
12. The composite rotor blade spar as recited in claim 9, wherein a leading edge and a trailing edge conic of said spar comprise only said braided bias angle fibers.
13. The composite rotor blade spar as recited in claim 9, wherein said zero degree fibers are positioned upon an upper and lower surface of said spar.
14. The hollow composite article as recited in claim 9, further comprising a separate composite sheet interwoven with said multiple of braided bias angled fibers and said multiple of zero degree fibers.
15. The composite rotor blade spar as recited in claim 9, wherein said mandrel is non-linear.

16. A method of forming a hollow composite article comprising the steps of:
 - (1) braiding a multiple of composite fibers to form a braided sleeve over a mandrel;
 - (2) locating the braided sleeve and the mandrel within a mold; and
 - (3) impregnating the braided sleeve with a resin;
 - (4) curing the resin; and
 - (5) removing the mandrel.
17. A method as recited in claim 14, wherein said step (1) further comprises braiding a multiple of bias angled fibers non-parallel to a longitudinal axis; and
interweaving a multiple of zero degree fibers with the multiple of braided bias angled fibers, the zero degree fibers substantially parallel to the longitudinal axis.
18. A method as recited in claim 16, wherein said step (1) further comprises locating the zero degree fibers upon an upper and lower surface of the article.
19. A method as recited in claim 16, wherein said step (1) further comprises passing the mandrel through a multi-axial braiding machine.
20. A method as recited in claim 16, wherein said step (1) further comprises passing the mandrel through a multi-axial braiding machine.
21. A method as recited in claim 16, wherein said step (1) further comprises locating a separate composite sheet within the braided sleeve.